Space Weather Forecast

Issued on Wednesday, 18 May 2022 at 01:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor to Moderate radio blackouts.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate over the past 24 hours, with a Moderate-class flare which peaked at 06/1145 UTC from a region in the northeast quadrant of the Sun. This is currently the most notable sunspot group, with recent growth and some significant magnetic complexity. Another region of note is in the southwest quadrant, being moderately sized, but it is now showing signs of fading slightly. All other regions are relatively simple at this time. A Coronal Mass Ejection (CME) was observed in imagery, likely from the northeast, and this has been assessed as probably passing behind Earth's orbit. There is low confidence however, and a glancing blow is possible on 20 May. No other Earth directed CMEs have been observed.

Solar Wind / Geomagnetic Activity: The solar wind shows signs of a coronal hole fast wind enhancement. Wind speeds rose from just below 500 km/s, to reach 550-600 km/s. The Interplanetary Magnetic Field was mainly weak, but showed moderate peaks between 17/0230-0930 UTC. The north-south component mostly varied weakly, but occasionally moderately, with a slight positive bias. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is likely to remain at Low to Moderate levels, with an ongoing chance of further Moderate flares, and a slight chance of Strong flares.

Solar Wind / Geomagnetic Activity: A weak CME was observed during 17 May. This has been assessed as most likely passing behind Earth's orbit on 20 May, but may give a glancing blow. Confidence is very low, however.
Solar winds are currently elevated with Earth apparently in a fast wind from a coronal hole. It is difficult to be sure of the exact source for this. However, solar winds are likely to be elevated through much of this forecast period, perhaps with a slight dip during Day 1 (18 May) before rising again later Day 1 or early Day 2 (19 May). Geomagnetic activity is expected to be largely Quiet to Unsettled. If we do see a brief dip in wind speeds followed by a further fast wind, or if we do see the CME on Day 3 (20 May), then Unsettled to Active spells are possible with a slight chance of a G1/Minor Storm interval.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring. There is a slight chance of this count rate increasing due to any notable flares, most likely from the sunspot on the southwest disc or from the more complex spot in the northeast of the disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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